

of *arnearia* have been recorded from Jones Estate so far. These individuals probably wandered so high in the process of dispersing the species. In the case of *specularia*, it appears to be well established at this elevation and will probably be found to occur even higher.

The specimens examined in this study have been collected over a period of nearly thirty years. It will be noted that there are no records of *arnearia* and *deducata caustolomaria* prior to 1998. This should not be interpreted to imply that these two taxa were absent from the area prior to 1998, but that they were probably overlooked earlier, although I am more or less certain that they were not attracted to the artificial light at the main study site between 1993 and 1997, when I paid more attention to members of this family. It can safely be stated that both these species appear sporadically at 1,500 m, although they might be well established in a locality not very far from the main study site.

Hitherto, seasonal variation had not been noted in this genus. The form *wirthi* nov. of *C. deducata caustolomaria* differs from the typical form in much

the same way as the spring form of the European moth *Eilicrinia cordiaria* Hübner gen. vern. *roeslerstaumaria* Staudinger differs from the typical summer form. As in the case of *Corymica*, not all species belonging to *Eilicrinia* Hübner are seasonally dimorphic. The two genera are usually placed close together. I have treated *wirthi* nov. as a seasonal form of *caustolomaria* rather than as an aberration, despite the paucity of specimens and other supportive data. Given the similar trend in *Eilicrinia* and the rarity of this species over its entire range, it seems best to proceed in this manner.

It is possible that *vitriger* will be found in the main Himalayan range in Kumaon eventually and that *C. specularia specularia* occurs further west along the outer ranges of the Himalaya.

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27. ADDITIONAL RECORDS OF BUTTERFLIES FROM MAHARASHTRA

I would like to add the following butterflies to the list of those already known to occur in Maharashtra, within the erstwhile Bombay Presidency Area.

Euploea klugi kollari: The species occurred regularly in the Colaba area of Mumbai from where I took 3 males and 2 females. Further, I took 2 males from Nalasopara and Tulsi Lake, north of Mumbai. At the time I did not consider *klugi* to be a great rarity, as we seemed to see them quite often. In those days, I never took many examples of the same species, being something of a conservationist, even before conservation became an issue. For this reason, I have only two females, as it is so similar to *E. core*. Being somewhat inexperienced then, I was unable to distinguish between *core* and *klugi* females in the field. I am certain that there was a small breeding colony in Colaba, as there were plenty of milkweed (*Calotropis*) plants close by. We were able to observe *Danais chrysippus*, *D. genuta* and *Euploea core core* in all their stages of development. My good friend of many years, Fr. A.E. Bean has also recorded a single male from Lonavala, Maharashtra.

All the *klugi kollari* were taken between May and October 1957 to 1961. As I have not been back to the area since then, I do not know if a breeding population still exists at Colaba. However, the occurrence of *klugi* at Nalasopara and especially Tulsi Lake, an area that I believe may now be protected should provide us with some hope. [Nalasopara is now built up, but Tulsi Lake is within the protected Sanjay Gandhi National Park — Eds]

Neopithecops zalmora dharm: I took a single male of this species in Mahabaleshwar on 21.x.1961. At that time, I was unaware that this species had never been taken in the area before. Both Wynter-Blyth (1957) and Evans (1932) report it from Sri Lanka, South India to Bengal and Kumaon to Burma (now Myanmar). It was only when I read Eliot and Kawazoes' book, BLUE BUTTERFLIES OF THE LYCAENOPSIS GROUP that I realised I might have something very special. Col. John Eliot was good enough to confirm the identity of the specimen in question a couple of years ago.

Fr. Bean, who has taken *zalmora* in other areas, has usually found it flying with *Megisba malaya*. The

specimen I took in Mahabaleshwar was flying with *malaya thwaitsei*.

I would suggest that the species does occur in Maharashtra even if it is extremely rare. As it is a very weak flier and found so far inland, I would certainly not consider it to be a 'wind blow'.

Appias wardi: I mentioned this species in an article in the *JBNHS* some 40 odd years ago. I took a

single male at Colaba on 5.vii.1957, but feel that this specimen may well have been wind blown from much further south.

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28. STUDIES ON THE ODONATA (INSECTA) FROM A BACKWATER SWAMP OF NORTHERN KERALA

Our present knowledge on the odonate fauna of estuarine and brackish water environments in India is confined to the state of Orissa and West Bengal on the east coast (Fraser and Drover 1921, Prasad and Ghosh 1982, 1988). Studies on odonates from the brackish water areas of the west coast of India have not been attempted earlier. Hence, this study was taken up at Chemballikundu, a backwater swamp in north Kerala from August 1999 to September 2000.

Chemballikundu swamp is a floodplain parallel to the Ezhimala hills, formed by rivers Ramapuram, Peruvamba and Kavaayi in Kannur district, situated at 12° 31' N and 75° 14' E. The area receives a mean annual rainfall of 3,000 mm, mainly from the southwest monsoon, from June to September. Maximum and minimum temperatures of 33.4 °C and 18.7 °C are experienced in April and December respectively.

Due to the variation in salinity over the seasons, the vegetation of the area is diverse, comprising of species such as *Nymphaea nouchali*, *Nymphoides indicus*, *Limnophylla heterophylla* and *Hydrilla verticillata*, mixed with tall reeds like *Mariscus javanicus*, *Fimbristylis ovata*, *F. ferruginea* and *F. aestivalis*. The embankments along the marshes and mudflats are covered with patches of mangrove species like *Avicennia officinalis*, *A. marina*, *Excoecaria agallocha*, *Aegiceras corniculatum*, *Achrosticum aureum* and *Acanthus ilicifolius*. The varying microhabitats provide good foraging and breeding grounds for many insects. The water is saline, except for a brief period during monsoon. Collections were made during October 1999 (post-monsoon), February-April 2000 (pre-monsoon) and July-September 2000 (monsoon), to

record seasonal variation and other related data. The odonates collected or observed are categorised as follows:

- A = Abundant: More than 15 observed during each visit/season
- C = Common: More than 8 observed during each visit/season
- UC = Uncommon: Not more than 4 observed during each visit/season
- R = Rare: Less than 4 observed during each visit/season
- NF = Not Found: Not observed during the season.

A total of 21 species of odonates under 19 genera belonging to 3 families were recorded from the wetlands of Chemballikundu. The suborders Zygoptera (damselflies) and Anisoptera (dragonflies) were represented by 8 and 13 species respectively. All the species are new reports from the area, and also from the estuarine ecosystem of western India, whereas *Aciagrion occidentale* and *Mortonagrion varralli* are new additions to the estuarine Odonata of India.

The seasonal collection showed a diversity of 20 species in post monsoon, 12 species in monsoon and 9 species in pre-monsoon. The low species diversity in summer may be due to high salinity resulting from the lowering of water level for aquacultural practices. In summer, the aquatic vegetation and reed beds dry up and the entire ecosystem changes till the onset of the Southwest monsoon. Species such as *Pseudagrion microcephalum*, *Mortonagrion varralli*, *Orthetrum sabina sabina*, *Brachythemis contaminata*, *Diplacodes trivialis*, *Pantala flavescens* and *Tholymis tillarga* were recorded throughout the survey, indicating multivoltinity. The species were identified from the FAUNA